

# A Survey of Sterilization Procedures Recommended to Diabetic Patients

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**D**URING the past several years, increasing emphasis has been placed on the need for medical practitioners to examine the provision of health services critically and scientifically. The need to investigate current medical practices is apparent in relation to the teaching role ascribed to health personnel. This is particularly significant in the instruction of patients with long-term, chronic diseases who must assume a large share of the responsibility for the management of their health

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care needs. A classic example is the instruction of the diabetic patient.

The importance of effective and adequate teaching of the diabetic assumes even greater significance since an estimated 4.4 million persons in this country have diabetes, and about 1.6 million or 8.2 persons per 1,000 population are unaware that they have the disease. Diabetes mellitus increases in prevalence with advanced age, reaching a peak 64.4 cases of diagnosed diabetes per 1,000 population in the age group 65–74 years (1a). Controlled research and medical data substantiate the hypothesis that initiation of treatment and teaching at the earliest possible stage of diabetes augurs a more optimistic prognosis than might otherwise be expected (1b).

Since nurses and physicians assume the major responsibility for instruction of the diabetic patient, some means of assessing the effectiveness of their teaching is indicated if the objectives of good health care are to be met. Several independent investigators have conducted such studies. Watkins (2) assessed diabetic patients in relation to

management of their disease and found that only four of 60 patients demonstrated acceptable practices in insulin dosage, urine testing, meal content and spacing, and foot care. Watkins' study of diabetics in their homes revealed that about one-third had inadequate equipment for insulin administration; 77 percent sterilized the equipment inadequately—if at all. The correlation coefficient of overall knowledge with overall management was found to be statistically significant at the 1 percent level.

Leifson's study of glycosuria tests performed by diabetics in their homes revealed that they made numerous errors in the manner of testing (3). Although glycosuria tests are simple and easy to teach, the assumption that they are accurately performed was found to be incorrect. For example, 86 percent timed the test improperly, 19 percent used material past expiration date, and 67 percent stored the material improperly. Such studies indicate the necessity of finding more effective means of teaching patients and evaluating the adequacy of the current instructional content.

### Objectives and Method

To identify some of the variables which might influence the adequacy of procedures being taught, we surveyed the current literature regarding information available to professional health workers who instruct diabetics. Additionally, we developed a questionnaire which was circulated to hospitals and university medical centers throughout the United States to investigate the adequacy of current practices in regard to teaching patients.

The study described here focused on one aspect of teaching diabetics syringe and needle sterilization. We selected syringe and needle sterilization as taught to diabetic patients for two major reasons: (a) scientifically based recommendations for the safest sterilization procedure to be taught were consistently lacking, and, where described, wide variations were noted among the references and (b) the diabetic population represents the largest number of persons receiving injections in the home on a regular, daily, long-term basis (4a).

Johnson (4b) noted “. . . the concept that diabetics are inherently more susceptible to infection can no longer be accepted as an unqualified fact.” However, according to Levine (5a), “Any superimposed disease process in a diabetic may alter the metabolic balance previously achieved, so that he must be protected from infection of all kinds

and guided in self-care that will aid in preventing the development of secondary disease entities.” It is within this framework that we researched the adequacy of procedures currently being taught to diabetics in regard to syringe and needle sterilization.

The normative or descriptive survey method was selected for this study because it was designed to determine typical, existing, and current conditions. Further, it enabled us to establish a body of knowledge from the acquisition of facts regarding certain characteristics, behaviors, and practices related to one aspect of teaching diabetics.

Questionnaires were sent to two hospitals—one general hospital and one university hospital—in each of the 50 States, for a total sample size of 100. These hospitals ranged in size from less than 200 to more than 900 beds. In the States which had no university medical center, a second general hospital was selected. University medical centers were selected because teaching is one of their three primary functions, and we were interested in determining if this function was extended to instruction of patients. General hospitals were polled to determine prevalent medical practices in hospitals throughout the nation. In addition, we hoped to determine whether or not any significant differences existed between the two types of hospitals in terms of adequacy of health procedures being taught.

The questionnaire was constructed to obtain data regarding size of the hospital, type of hospital, whether or not a formal teaching program for diabetics existed, and who did the teaching. Information about the general teaching program for diabetics was obtained through use of closed (categorical) questions. Open-end or free-response questions were used to elicit information regarding the specific content and procedure for syringe and needle sterilization taught by the respondents to their diabetic patients.

For the purposes of this study, it was necessary to define several terms. The definitions of terms were developed following a review of literature which focused on several related aspects of the problem: (a) proper cleansing methods, (b) nature and number of micro-organisms present on the equipment, (c) type of equipment or supplies to be sterilized, (d) intended use of equipment, (e) type of asepsis required (medical or surgical), and (f) time required for sterilization according to altitude and atmospheric pressures (6a-9). The definitions are as follows:

*Asepsis.* The absence of disease-producing microorganisms called pathogens.

*Medical asepsis.* All practices which help reduce the transfer of disease-producing organisms from one person or piece of equipment to another person, either directly or indirectly. This practice increases the safety of the environment by decreasing the number of pathogens in it.

*Surgical asepsis.* All practices which involve rendering and keeping objects and areas free from all microorganisms (sterile). This is employed when there is need to protect the person from pathogens in the environment.

*Sterilization.* The process by which all microorganisms are destroyed, usually by the use of heat such as boiling, steam under pressure, or dry heat. Occasionally, chemicals also are used.

*Acceptable.* The term used to categorize the techniques of syringe and needle sterilization which render the equipment sterile (surgical asepsis) before each use or the process of boiling, baking, or disinfecting equipment long enough to destroy vegetative forms of bacteria, most spore forms, and some viruses. Examples of surgical asepsis include one-time use of sterile, disposable equipment, steam under pressure (autoclave or home pressure cooker), and baking or disinfecting equipment for a period of time sufficient to destroy all pathogens—both vegetative and spore forms. Boiling equipment 20 minutes before each use is an acceptable method of sterilization if the equipment is known to be free of microorganisms, such as tetanus, botulinus, or tuberculosis, and the equipment is not used for major surgical procedures (7, 9).

*Minimally acceptable.* The term used to categorize recommended techniques of syringe and needle sterilization which meet the criteria for medical asepsis. This category includes boiling or disinfecting equipment for less time than that required for sterilization (surgical asepsis) but sufficient to reduce the number of pathogens and to destroy vegetative forms of bacteria. Spore-forming bacteria and some viruses would not be destroyed by the processes included in this category. When the respondents recommended more than one procedure, one of which met the criteria of surgical asepsis and one of which met medical asepsis standards, the procedure was classified as minimally acceptable.

*Unacceptable.* The term used to categorize those recommended techniques of syringe and needle sterilization or disinfection which do not meet the criteria for either medical or surgical asepsis. This category includes erroneous selection of disinfectants, insufficient time in boiling or heating to achieve medical or surgical asepsis, re-use of disposable equipment, and improper cleansing of equipment prior to disinfection. Included also are those techniques described by the respondents which did not provide sufficient information to evaluate the procedure in terms of the degree of acceptability.

*Formal teaching program.* The term used to denote an organized teaching program as identified by the respondents. Such a program includes course outline or specific instructional content or both, a specified length of time for the program, and regularly assigned teaching personnel.

*No formal teaching program.* The term used to describe instruction of diabetics in hospitals which have no

organized teaching program. In these hospitals, diabetics receive bedside instruction at the discretion of the nursing staff or per physician's order, or both, or are referred for outpatient instruction in community agencies.

## Results

A total of 73 questionnaires (43 general hospitals, 30 university hospitals) or 73 percent were returned by the participating hospitals. Due to time limitation for the study, followup letters were not sent to the hospitals that did not respond.

The data from the questionnaires were tabulated to determine the acceptability of the instruction in regard to syringe and needle sterilization. The data were grouped into three categories describing the adequacy of the procedures taught in regard to this one aspect of diabetic teaching. The categories were (a) acceptable, (b) minimally acceptable, and (c) unacceptable.

The chi-square test of significance was applied to these categories as they related to such variables as hospital size, type of hospital, and presence or absence of a formal diabetic teaching program.

*Adequacy of diabetic instruction.* Analysis of the acceptability of the recommended procedure for syringe and needle sterilization revealed that 34.2 percent of the total number of hospitals had acceptable procedures, 56.2 percent recommended minimally acceptable procedures, and 9.6 percent had unacceptable procedures. A chi-square test of significance comparing differences between university and general hospitals in relation to the acceptability of procedures was computed but was not significant at the 0.05 level (table 1). However, it was interesting to note that the percentage of university hospitals with unacceptable procedures was almost twice that of the general hospitals, although the percentages of general and university hospitals with minimally acceptable procedural instructions were similar.

Table 2 gives the frequency distribution in the hospitals of all recommended procedures for syringe and needle sterilization according to the information obtained from the respondents. These methods have been categorized as acceptable, minimally acceptable, or unacceptable according to criteria set up for the study and as previously described in this article.

As indicated in table 2 there were wide variations in the procedures recommended for syringe and needle sterilization. Four basic methods were

noted: boiling prior to each use, boiling weekly with interim storage in a disinfectant agent, baking, and use of disposable syringes and needles. The greatest variation occurred in the time period recommended for boiling, which ranged from a minimum of 3 minutes to a maximum of 1 hour

before each use. Boiling the syringe 5 minutes before each use was the time period most commonly employed; 14 percent of all respondents indicated that they recommended this procedure. These same respondents stated that they encouraged their patients to use disposable syringes if

**Table 1. Acceptability of syringe and needle sterilization procedures taught to diabetics, by availability of formal teaching program, size of hospital, and type of hospital**

Teaching program, hospital size, and type of hospital	Acceptable		Minimally acceptable		Unacceptable		Chi-square	P
	Number	Percent	Number	Percent	Number	Percent		
<b>Formal teaching program:</b>								
Available.....	8	21.0	25	61.0	5	71.4	6.39	0.05
Unavailable.....	17	48.6	16	39.0	2	28.6		
<b>Hospital size:</b>								
Less than 300 beds.....	11	52.3	7	17.1	3	42.9	7.44	(1)
300-700 beds.....	11	31.4	22	53.7	2	28.6		
More than 700 beds.....	3	17.7	12	29.3	2	28.6		
<b>Type of hospital:</b>								
General.....	16	37.2	24	55.8	3	6.98	1.02	(1)
University.....	9	30.0	17	56.6	4	13.3		
All hospitals.....	25	34.2	41	56.2	7	9.6		

<sup>1</sup> Not significant.

**Table 2. Frequency distribution of procedures for syringe and needle sterilization or disinfection, or both**

Procedure category and number of hospitals	Boiling method	Time (minutes)	Frequency	Interim storage	Disposables recommended	Other method
<b>Acceptable:</b>						
20.....	No.....			No.....	Yes.....	No
2.....	Yes.....	20	Each time.....	No.....	No.....	No
2.....	Yes.....	30	Each time.....	No.....	No.....	No
1.....	Yes.....	60	Each time.....	No.....	Yes.....	No
<b>Minimally acceptable:</b>						
10.....	Yes.....	5	Each time.....	No.....	Yes.....	No
9.....	Yes.....	5	Each time.....	No.....	No.....	No
3.....	Yes.....	5	1 or 2 times weekly.....	70 percent alcohol.....	No.....	No
2.....	Yes.....	?	?	Alcohol.....	Yes.....	No
2.....	Yes.....	5	1 time weekly.....	91 percent alcohol.....	No.....	No
2.....	Yes.....	10	Each time.....	No.....	No.....	No
1.....	Yes.....	3	Each time.....	No.....	Yes.....	No
1.....	Yes.....	5	1 time weekly.....	Alcohol.....	No.....	Bake, 350° F., 15 minutes.
1.....	Yes.....	5	1 time weekly.....	91 percent alcohol.....	Yes.....	No
1.....	Yes.....	5-10	Each time.....	No.....	No.....	No
1.....	Yes.....	5	Each time or 1 time weekly.....	Alcohol.....	No.....	No
1.....	Yes.....	10	Each time.....	No.....	Yes.....	No
1.....	Yes.....	10	Each time or 1 time weekly.....	Alcohol.....	Yes.....	No
1.....	Yes.....	10	1 time weekly.....	91 percent alcohol.....	No.....	No
1.....	Yes.....	10	Each time.....	No.....	No.....	Bake, 350° F., 15 minutes.
1.....	Yes.....	15	Each time.....	No.....	No.....	No
1.....	Yes.....	15	1 time weekly.....	Place in steritube.....	No.....	No
1.....	Yes.....	20	1 time weekly.....	Alcohol.....	No.....	No
1.....	Yes.....	20	1 time weekly.....	91 percent alcohol.....	No.....	No
<b>Unacceptable:</b>						
3.....	Yes.....	?	?	?	No.....	No
2.....	Yes.....	?	?	70 percent alcohol.....	No.....	No
2.....	No.....		Change disposables each week.	91 percent alcohol.....	Yes.....	No

possible. An additional 12 percent of the respondents indicated that they recommended boiling for 5 minutes before each use, but did not mention use of disposable syringes. Thus, the respondents in these two categories comprised 26 percent of the total number of respondents and represented 46 percent of the respondents who met the criteria for minimally acceptable procedures for syringe and needle sterilization. Other procedures which met the criteria of minimal acceptance varied widely, with only one to three respondents indicating that they employed each method.

In the unacceptable category, 4 percent (three hospitals) of the total number of respondents who indicated that boiling was their method of choice for syringe and needle sterilization reported no time period. Two hospitals or 2.6 percent of the respondents indicated that they recommended boiling and interim storage in alcohol. An additional 2.6 percent (two hospitals) recommended storage in alcohol only and recommended the use of disposable syringes.

Twenty-seven percent of the total number of respondents (20 hospitals) recommended the use of disposable syringes and needles only. This number represented 80 percent of the hospitals which met the criteria for acceptable procedures for instruction of diabetics in syringe and needle sterilization. The remaining procedures which were classified as acceptable were boiling the syringe and needle for time periods ranging from 20 minutes to 1 hour prior to each use as determined by consideration of such factors as altitude, atmospheric pressure, and types of organisms to be destroyed.

*Formal diabetic teaching programs.* Chi-square tests were applied to determine if the presence of a formal teaching program influenced the acceptability of the procedure recommended for

syringe and needle sterilization. These tests revealed a higher percentage (48.6 percent) of acceptable sterilization procedures recommended in hospitals without formal teaching programs than in hospitals with formal programs (21 percent). Formal teaching programs for diabetics were available in 61 percent (25 of 41 hospitals) with minimally acceptable programs and in 71.4 percent (five of seven hospitals) with unacceptable programs. These data are shown in table 1. The chi-square test was significant at the 0.05 level of confidence. This finding was surprising, as we had hypothesized that the adequacy of the procedures taught would increase where formal teaching programs were in existence. There were no significant differences between the university and general hospitals.

Forty-six and one-half percent (20 of 43) of the general hospitals and 60 percent (18 of 30) of the university hospitals had formal teaching programs for instruction of the diabetic (table 3). Fifty-two percent (38 of 73) of the total number of hospitals had formal teaching programs and 48 percent (35 of 73) had no formal program.

There was a higher percentage of formal teaching programs in hospitals with more than 300 beds. (This trend was apparent in both university and general hospitals, but university hospitals with more than 700 beds had approximately 30 percent more formal programs than did general hospitals with more than 700 beds.) Formal programs existed in 82 percent of all hospitals with more than 700 beds, while only 38 percent of all hospitals with less than 300 beds had formal teaching programs. The chi-square test comparing the numbers of beds to the type of program (formal program or no program) was significant at the 0.02 level of confidence (table 3).

*Hospital size.* The acceptability of the recom-

**Table 3. Relationship between type and size of hospital and existence of a formal teaching program for diabetics**

Type and size of hospital	Formal program		No program		Chi square	P
	Number	Percent	Number	Percent		
Type:						
University.....	18	60.0	12	40.0	1.29	(1)
General.....	20	46.5	23	53.5		
Size:						
Less than 300 beds.....	8	38.1	13	61.9	8.46	0.02
300-700 beds.....	16	45.7	19	54.3		
More than 700 beds.....	14	82.4	3	17.6		

<sup>1</sup> Not significant.

mended procedure for syringe and needle sterilization was compared with the size of the hospital as determined by the number of beds (table 1). Acceptable procedures for syringe and needle sterilization were recommended in 52.3 percent (11 of 21) of hospitals with less than 300 beds, 31.4 percent (11 of 35) of hospitals with 300–700 beds, and 17.7 percent (three of 17) of hospitals with more than 700 beds. Minimally acceptable procedures were taught in 17.1 percent (seven of 41) of hospitals with less than 300 beds, 53.7 percent (22 of 41) of hospitals with 300–700 beds, and 29.3 percent (12 of 41) of hospitals with more than 700 beds. Unacceptable procedures were taught in 42.9 percent (three of seven) of the hospitals with less than 300 beds and, 28.6 percent (two of seven) of the hospitals in both categories of 300–700 and more than 700 beds. The chi-square test comparing the size of the hospital to the adequacy of the recommended procedure was not significant. There were no significant differences between university and general hospitals.

No consistent pattern or correlation could be established between the size of the hospital and the adequacy of the procedure recommended for syringe and needle sterilization.

The data were further compressed into categories of less than 500 beds and more than 500 beds. Again, there was no correlation between the size

of hospital and the adequacy of the procedure recommended for syringe and needle sterilization.

There were no significant differences between university and general hospitals. The chi-square was computed but was not significant at the 0.05 level of confidence.

### Rationale for Procedure Selection

Respondents were asked to select the rationale for their sterilization procedure within the following categories (table 4): not applicable (appropriate for disposable syringes), policy recommended by hospital procedure committee, policy recommended by in-service education committee, policy recommended by infection control committee, research study, and other. In the compilation of the data, the "other" category included rationales which fell within the following areas: publications, physician recommendation or nursing staff decision, or both, patient preference, and no rationale. (Respondents could check more than one category.)

Paradoxically, 11 of the 25 hospitals which met the criteria for acceptable procedures for syringe and needle sterilization gave no rationale for the selection of the method. This represents 44 percent who could not recall the scientific rationale for their action.

Another significant factor was the number of

**Table 4. Acceptability of syringe and needle sterilization procedures, by rationale for selection of procedures**

Rationale	Acceptable		Minimally acceptable		Unacceptable	
	Number	Percent <sup>1</sup>	Number	Percent <sup>1</sup>	Number	Percent <sup>1</sup>
Not applicable <sup>2</sup> . . . . .	6	24.0	0	0	0	0
Policy recommended by:						
Hospital procedure committee . . . . .	0	0	4	9.80	0	0
In-service education committee . . . . .	0	0	2	4.90	0	0
Infection control committee . . . . .	1	4.0	1	2.44	1	14.3
Research study . . . . .	1	4.0	1	2.44	0	0
Hospital procedure and in-service education committees . . . . .	1	4.0	2	4.90	0	0
Hospital procedure, in-service education, and infection control committees . . . . .	1	4.0	1	2.44	0	0
Hospital procedure and infection control committees . . . . .	2	8.0	1	2.44	1	14.3
In-service education committee and research study . . . . .	0	0	1	2.44	0	0
Infection control committee and other . . . . .	0	0	1	2.44	0	0
Other:						
No rationale . . . . .	11	44.0	5	12.20	1	14.3
Patients' preference . . . . .	0	0	1	2.44	1	14.3
Decision of physicians or nursing staff, or both . . . . .	2	8.0	15	36.60	1	14.3
Publications <sup>3</sup> . . . . .	0	0	6	14.60	2	28.6

<sup>1</sup> Percentage within category.

<sup>2</sup> Due to use of disposables only.

<sup>3</sup> Included texts, Government publications, and literature from pharmaceutical companies.

**Table 5. Types of hospital personnel who instruct diabetics in needle and syringe sterilization**

Teaching personnel	Hospitals	
	Number	Percent
Dietitian, nursing staff, physicians...	16	21.92
Dietitian, nursing staff, .....	15	20.55
Dietitian, nursing staff, interns or residents, or both, physicians.....	8	10.96
Dietitian, nursing staff, interns or residents, or both, physicians, others <sup>1</sup> .....	6	8.22
Dietitian, nursing staff, others.....	5	6.85
Nursing staff.....	5	6.85
Dietitian, nursing staff, interns or residents, or both.....	4	5.48
Dietitian, others.....	4	5.48
Nursing staff, physicians.....	2	2.74
Nursing staff, others.....	2	2.74
Physicians, others.....	1	1.37
Nursing staff, interns or residents, or both.....	1	1.37
Dietitian, nursing staff, interns or residents, or both, others.....	1	1.37
Dietitian, interns, others.....	1	1.37
Dietitian, nursing staff, physicians, others.....	1	1.37
Dietitian.....	1	1.37

<sup>1</sup> Examples within the "others" category are in-service education consultants, nursing students, social workers, and vocational rehabilitation workers.

times physicians, nursing staff, or both, were involved in the decision making process for procedure selection. As noted in table 4, 15 of the 41 hospitals (36.6 percent) indicated that physicians or nurses selected the procedure which met the criteria for the minimally acceptable category. No rationale was cited for the selection of a particular procedure when the nurse or physician made the decision.

Publications were cited as a reference for procedure selection by six respondents within the minimally acceptable category and two respondents in the unacceptable category.

The hospital procedure committee, in-service education committee, and infection control committee seemed to have little influence upon procedure selection.

### Who Teaches the Diabetic?

In the survey, respondents were asked, "Who teaches the diabetic?" Within the five categories listed, the results were as noted in table 5. It was interesting to note that in more than 40 percent of the responses the teaching responsibility was ascribed to either dietitians, nursing staff, and physicians or some combination within these categories.

These professionals were noted also in combination with interns or residents and others, but these combinations represented relatively small percentages.

### Discussion

A survey of the current literature in regard to syringe and needle sterilization revealed a dearth of instructional information and scientifically based recommendations available to health educators. Where described, wide variations were noted among the references. Thus, it was not surprising to find similar variations in instructional methods and scientific rationale denoted by the respondents to this hospital survey. This has particular significance for instructing diabetic patients.

Procedures recommended to the patients varied from boiling equipment 3 minutes before each use to boiling "about an hour" each time. This wide variation raises issues relative to infection control in the health maintenance of the diabetic patient. Levine (5b) noted, ". . . any procedure which must encroach on the normal defensive integrity of the skin must be meticulous to avoid the danger of introducing infection." When the skin is broken, either intentionally as in the case of injections, or through accident, pathogenic organisms have a good portal of entry, first locally and then systemically. Thus, all items used to penetrate the skin surface in order to inject substances into the body should be sterile (6b).

If the type of organism on equipment and supplies is known, the selection of a safe sterilization or disinfection procedure becomes relatively easy. Unfortunately, however, in most situations the type of organism contaminating equipment and supplies is frequently unknown. According to Fuerst and Wolff (6c); "In the home, where the nature of contaminating organisms occasionally can be ascertained with some safety and where the patient may have developed immunities to certain organisms commonly found in his environment, sterilization and disinfection procedures can be modified more safely than they can be in a hospital or a clinic." When the decision is made to teach the procedures of syringe and needle sterilization which meet the criteria of medical asepsis rather than surgical asepsis, the health educator should be sure there has been an assessment of the diabetic patient's home environment and resources.

Two respondents indicated they instructed pa-

tients to soak disposable syringes in alcohol before and after each use and to replace the syringe once a week. This practice is questionable when one considers the potential for damage to the plastic with the use of alcohol (10). For example, a damaged syringe may increase the probability of dosage alteration as well as increase the possibility of altered effectiveness of the insulin.

Respondents frequently were not specific about the strength or type of alcohol recommended for interim disinfection and the basis for selection of the alcohol. Appropriate selection insures that the minute quantities of alcohol carried into the vial of insulin during injection preparation do not have a deleterious effect. Lilly Research Laboratories (11) noted that the denaturing materials, perfumes, and resins found in commercial alcohol can adversely affect insulin, and ethyl alcohol in a high concentration can precipitate protein. The strength and type of alcohol should certainly be taken into consideration for instructional purposes.

Twenty-three percent of the respondents stated they had no reference or rationale for selection of the procedure they taught. This was irrespective of whether the procedure was acceptable, minimally acceptable, or unacceptable. Others cited a rationale which we would define as inaccurate or incorrect. For example, this would include the respondents who cited a rationale such as "the patients select the procedure" without an essential knowledge base or "re-use of disposable syringes to decrease the cost to the patient."

The attempt to identify some of the variables which might influence the quality of procedures taught was not completely reached due to insufficient data. However, it did appear that lack of reliable information and diversity of opinion in the literature were significant factors. This was substantiated by the finding of wide variation in instructional content currently in practice in hospitals nationwide.

Further interest was evident from respondents who requested assistance with some phase of their program. The majority of respondents requested information concerning the findings of this survey. There seems to be a high level of motivation toward a teaching framework for the diabetic patient, but a huge gap exists in the educational materials necessary to insure teaching of acceptable procedures, at least in reference to this procedure.

Many respondents identified dietitians, nursing

staff, and physicians as the personnel responsible for the diabetic teaching function. This implies the necessity for scrutiny of the programs and educational material available for this function. In addition, this prescribes inclusion of theoretical content and opportunities for practice of the teaching function within the educational programs of these practitioners.

Some of the most striking needs identified by this survey are improved and standardized methods of instruction and scientifically based recommendations available in the literature which is commonly referred to and used by health educators and practitioners. Health educators must have a better understanding of diabetes and its significant factors if they are to assist diabetics in effective health maintenance. The diabetic is doomed to follow poor health practices if all instructional content shows the same wide variations found in this study.

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**PURINTUN, LYNN R. (University of California at Los Angeles School of Nursing) and McGRANE, HELEN F.: *A survey of sterilization procedures recommended to diabetic patients. Health Services Reports, Vol. 87, April 1972, pp. 357-365.***

One hundred questionnaires were sent to hospitals in the 50 States to obtain data regarding the adequacy of current practices in the instruction of the diabetic patient in relation to syringe and needle sterilization. Seventy-three questionnaires (43 general hospitals and 30 university hospitals) or 73 percent were returned by the participating hospitals.

To describe the adequacy of procedures being taught in regard to syringe and needle sterilization, the data were grouped into three categories: (a) acceptable, (b) minimally acceptable, and (c) unacceptable. Thirty-four percent of all hospitals (university and general) met the criteria for acceptable teaching procedures, 56.2 percent had minimally acceptable procedures, and 9.6 percent had unacceptable methods.

Chi-square tests of significance comparing the acceptability of the recommended procedure for syringe and needle sterilization to

the variables of hospital size, type of hospital, and presence or absence of a formal diabetic teaching program were computed. There were no significant differences between university and general hospitals in any aspect of the study. Thus, the analysis and discussion of data pertain to all hospitals. The chi-square tests comparing the availability of a formal teaching program to the acceptability of the procedure recommended was significant at the 0.05 level of confidence. The relationship between the availability of a formal diabetic teaching program and the variables of size and type of hospital was also analyzed using the chi-square test. The relationship between the size of the hospital and the availability of a formal teaching program was significant at the 0.02 level. The remaining chi-square values were not significant at the 0.05 level.

Information obtained from the respondents indicated that 40

percent of them ascribed the teaching role to either dietitians, nursing staff, or physicians or some combination within these categories.

Fifteen of the 41 hospitals which recommended minimally acceptable procedures stated that physicians or nursing staff members, or both, made the decision regarding the sterilization procedure taught to the diabetic. The rationale for their decision was not given. Thus, in the minimally acceptable category, physicians or nurses selected the method of sterilization 36.6 percent of the time.

The results of this survey indicate that many hospitals are teaching sterilization or disinfection procedures which are inadequate or unsafe, or both. This suggests a need for standard procedures, evaluated critically by qualified experts and available to the physicians, nurses, and health workers who are responsible for instruction of the diabetic.